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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/671,301	09/28/2000	Takeo Kitayama	PM 273903558220	8390
7590 10/31/2003			EXAMINER	
Kendrew H Colton			GRAY, JILL M	
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1801 K Street NW			ART UNIT	
Suite 401L			PAPER NUMBER	
Washington, DC 20006			1774	

DATE MAILED: 10/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/671,301

Applicant(s)

KITAYAMA ET AL.

Examiner

Jill M. Gray

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

In view of the appeal brief filed on August 12, 2003, PROSECUTION IS HEREBY REOPENED. A new grounds of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2 and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yagi et al, 4,894,281 (Yagi) in view of Nakajima et al, 6,207,600 B1 (Nakajima) and Wakatsuki et al, 5,039,748 (Wakatsuki).

Yagi teaches a polypropylene-based fiber-reinforced molded body comprising ultra-high-molecular-weight polyethylene fibers or ethylene copolymerized with an  $\alpha$ -olefin such as propylene, per claim 2 (column 6, lines 27-30) and a polypropylene matrix

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wherein the melting point of the polypropylene matrix resin is about 150°C to 180°C (column 11, lines 3-14). In addition, Yagi teaches that the fibers may be in the form of woven or knitted fabric, as required by claim 4 and oriented in a single direction, per claim 5. See column 2, lines 9-10 and Figure 7.

While Yagi does not specifically teach that his fibers have a melting point in the range set forth in claim 2 or such that the formula of claim 1 is satisfied, he does teach that the melt kneading of the fibers is carried out at a temperature of 150°C to 300°C (column 7, lines 22-27). This teaching clearly suggests a melting point of the fibers that is within the range contemplated by applicants. Moreover, Yagi teaches at column 1, lines 20-30, that composite structures comprising ultra-high-molecular-weight polyethylene fiber or polypropylene fiber and a matrix of polypropylene, wherein the matrix has a melting point of at least 3°C lower than the melting point of the polyolefin fiber are known in the art. In view of the general level of skill and knowledge in the art at the time the invention was made, it would have been obvious to one of ordinary skill to adjust the melting points of both the fiber and matrix material of Yagi such that the matrix has a melting point of at least 3°C less than that of the reinforcing fibers. To further modify the melting points of the fibers and/or the matrix material such that the formula of claim 1 is satisfied is construed to be well within the normal purview of the art. Also, it is the examiner's position that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller*, 105 USPQ 233 (CCPA 1955).

Yagi does not specifically teach "polypropylene fibers" per se, however, he does teach at column 6, lines 23-30, that his ultra-high-molecular-weight polyethylene includes ethylene polymers obtained by Ziegler polymerization of ethylene and a small amount of other  $\alpha$ -olefin such as propylene, 1-butene, 4-methyl-1-pentene or 1-hexene. In addition, Yagi teaches that it is known in the art to use either ultra-high-molecular-weight polyethylene or polypropylene fibers as reinforcement for polypropylene matrix (column 1, lines 20-24). This teaching would have rendered obvious ethylene/propylene copolymers as well as terpolymers, as required by claim 2 and provided a suggestion to the skilled artisan that ethylene/propylene copolymers could be used with a reasonable expectation of success. Moreover, while Yagi may be drawn specifically to ultra-high-molecular-weight polyethylene fibers, one of ordinary skill in the art at the time the invention was made, would have been reasonably motivated to substitute the ultra-high-molecular-weight polyethylene fibers of Yagi with polypropylene fibers since it was known in the art that both types of fibers can be used successfully as reinforcement for polypropylene matrixes to obtain high strength composite structures. Yagi is silent as to adding a nucleating agent to the resin that forms his fibers and the fiber diameter.

Nakajima teaches polypropylene fibers having a melting point of 160°C to 168°C that can be used as reinforcement, as required by claim 2. See column 1, line 12 and column 2, lines 50-51. At column 8, lines 49-54, Nakajima teaches that additives such as nucleating agents can be added to the polypropylene resin and column 9, line 54,

that the fibers can be formed into a knit fabric, per claim 4. In addition, Nakajima teaches in Table 2(1/2) a fiber diameter within applicants range as set forth in claim 6.

The utility of polypropylene fibers as reinforcing fibers is well known in the art, as evidenced by the teachings of Yagi and Nakajima. While Nakajima does not specifically teach that his fibers can be used as reinforcement in plastics, it is the examiner's position that the skilled artisan is expected and presumed to know something about the art other than what a reference literally teaches, and in the instant case, reinforcing plastics with polypropylene fibers is known. *In re Jacoby*, 309 F.2d 513, 135 USPQ 317 (CCPA 1962); *In re Bozek*, 416 F.2d 1385 163 USPQ 545 (CCPA 1969); *In re Sovish*, 769 F.2d 738, 226 USPQ 771 (Fed. Cir. 1985). The teachings of Nakajima that his fibers can be used as reinforcement, would have motivated the skilled artisan to immediately envisaged the fibers of Nakajima as reinforcement in other known polypropylene fiber reinforced matrix materials, such as plastics. "The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art." *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). "Thus, where the invention sought to be patented resided in a combination of old elements, the proper inquiry is whether bringing them together was obvious and not, whether one of ordinary skill having the invention before him, would find it obvious through hindsight to construct the invention from elements of the prior art." *In re Warner*,

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379 F.2d. 1011, 1014-17, 154 USPQ 173, 175-78 (CCPA 1967). Thus, *prima facie*, one of ordinary skill in this art following the teachings of Yagi and Nakajima and the general level of knowledge and skill in the art would have reasonably arrived at the claimed invention encompassed by the present claims.

As to the nucleating agent, the addition of nucleating agents to polypropylene resins to improve the strength of the resultant fibers is known in the art as evidenced by the teachings of Wakatsuki. See column 1. Hence, to form polypropylene fibers having the requisite melting point and diameter, and, that can be used as reinforcement in a composite material, wherein said fibers have a nucleating agent incorporated therein, essentially as taught by Nakajima, and contemplated by applicants, is not construed to be inventive.

Therefore, it is the position of the examiner that the combined teachings of Yagi, Nakajima and Wakatsuki would have rendered obvious the invention as claimed in present claims 1-2 and 4-6.

Claims 1-2 and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harpell et al, 4,501,856 (Harpell) in view of Wakatsuki et al, 5,039,748 (Wakatsuki).

Harpell teaches a composite containing a network of polypropylene fibers of high tenacity and modulus and a matrix that has propylene crystallinity such as polypropylene. See abstract. The polypropylene fibers have a melting point of at least 168°C, as required by claim 2, and the matrix has a melting point that is at least 3°C lower than the melting point of the fiber. See column 2, lines 4-9. In addition, the fibers

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can be in the form of a woven structure or oriented in a single direction as required by claims 4 and 5. See column 2, line 65 through column 3, and line 10. Harpell does not teach that a nucleating agent is added to the polypropylene resin forming the reinforcing fibers or the fiber diameter.

Wakatsuki teaches high strength polypropylene fibers formed from polypropylene resin having a nucleating agent incorporated therein. The nucleating agent is added to enhance the strength of the polypropylene fibers. See column 1 and column 5. It would have been obvious to one of ordinary skill in the art to use as the polypropylene fibers of Harpell, high strength polypropylene fibers as taught by Wakatsuki with the reasonable expectation of obtaining high strength composite materials.

As to the specific formula in claim 1, Harpell provides direction to one of ordinary skill in the art to adjust the melting points of both the fiber and matrix material such that the matrix has a melting point of at least 3°C less than that of the reinforcing fibers. To further modify the melting points of the fibers and/or the matrix material such that the formula of claim 1 is satisfied is construed to be well within the normal purview of the art. Also, it is the examiner's position that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller*, 105 USPQ 233 (CCPA 1955). Regarding claim 6, this claim is drawn to the size of the fiber wherein changes in size are not ordinarily a matter of invention. *In re Rose*, 105 USPQ 237 (CCPA 1955).



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Therefore, it is the examiner's position that the combined teachings of Harpell and Wakatsuki would have rendered obvious the invention as claimed in present claims 1-2 and 4-6.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-2 and 4-6 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wales, 3,207,739 teaches adding nucleating agents to polypropylene resins to improve the mechanical and/or physical properties of polypropylene articles.

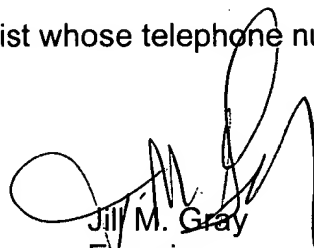
No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jill M. Gray whose telephone number is 703.308.2381. The examiner can normally be reached on M-F 10:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on 703.308.0449. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0651.



Jill M. Gray  
Examiner  
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jmg